Traditional map design vs. info graphics: motivating students to reveal their talents – Examples from a student assignment collection depicting 47 distinct topics

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Abstract. A student assignment within the concluding module on map compilation is taken to elaborate on the difference between maps (cartography) and info graphics (information design). By describing the task and approach, the various skills adding to the outcomes – a more traditional newspaper map and an appealing info graphics each for up to now 47 distinct topics – are demonstrated and discussed. This is meant to highlight the still existing need of important original carto-graphic skills in the otherwise rather IT-focused training of nowadays.

Keywords: newspaper map, info graphics, cartographic skills

1. Introduction on Background

Nowadays info graphics imparting knowledge seem to receive more attention than thematic maps. While information design is almost entirely the domain of graphic designers, there is the common believe that maps can be produced by anyone. But why should trained cartographers not also be able to come up with appealing info graphics?

At Karlsruhe University of Applied Sciences, students following the study course leading to a Bachelor degree in Cartography and Geomatics follow in their 4th semester an advanced and concluding module on map compilation. This module still exists in the study course Geoinformation Management for those students specializing in Cartography and Geomedia, which has been introduced from the academic year 2012. In a first assignment the students are asked to design an info graphics as well as a map based on the same statistical data. It proved to be a perfect means for

right-away challenging students at the start of a major practical seminar and thus for the lecturer to learn about existing skills and talents of the prospective cartographers not having been taught and supervised by the lecturer before.

2. Comparing Cartography and Information Design

2.1. Some General Remarks

Info graphics have become very popular, this not only in television and the Internet but increasingly in magazines and newspapers. Information design is extending into our daily life, with Wilbur & Burke (1998) referring to orientation or navigation systems, the graphical representation of statistics, maps, operating instructions, interface design and information architectures. All the many data needs to be packaged in handy, self-explaining and illustrative graphics (cp. Schuller 2009). Being flooded by information these days, graphics can replace lengthy text directing visual perception to what otherwise might remain hidden. Or they act as eye-catchers making people stop and redirect attention to the accompanying text. Various design means like photography, illustration by hand or DTP, typography or all combined (mixed media) are applied for a catchy visualisation. Pictures provoke emotions and therefore have impacts. Information design creates this emotional link, has become part of lifestyle, and offers infotainment (Schaab et al. 2009).

Fancy looking maps have become without doubt fashionable. But graphic design people do generally not enjoy the tedious work of making a map (cp. Schaab et al. 2009). It is the cartographer who still believes in the necessity of accurateness to convey and reveal geospatial relationships and in the benefits of sticking to cartographic design rules to ensure effective communication. While around him the concept of the possibly most objective representation of reality is eroding, the same is also true for the cartographic rule set (Waldt 2008). The craft skills formerly required to understand map-making are losing importance (Dorling & Fairbairn 1997). However, for maps serving the purpose of orientation (e.g. topographic maps) a trained cartographer will still mainly follow conventions in the use of map symbols, while for thematic maps the appropriate use of the graphic variables will result in suitable map types. He or she further learns how to ensure an information hierarchy plus the handling of text to primarily provide geospatial addresses (Kraak & Ormeling 2003).

2.2. Elaborating and Pointing to the Differences

The work on the assignment starts with students bringing along (traditional) maps as well as info graphics from newspapers, magazines or the Internet. This forms the basis for jointly discussing the differences between the two visualization types. An according juxtaposition can be found in *Table 1*. Regularly the following drawbacks in info graphics which make use of maps are noticed by the students: the doing without a graphic clue for communicating quantities, redundancy by graphically visualizing the data plus adding the same information as annotations, the arrangement of annotations in text blocks thus confusing spatial patterns in favour of the overall graphic design, the non-consideration of map projection properties, a poor generalization of base map features, the missing of important map elements, and the use of only few of the cartographic representation methods (predominantly choropleth mapping).

Table 1. Comparing traditional newspaper maps and info graphics.

	traditional newspaper maps	**info graphics**
origin	part of classical cartography	distinct journalistic representation format
prepared by	cartographers	graphic designers or journalists
found in	newspapers and similar press products	popular in the mass media
topics	often a political or historical topic	here timeliness matters: occurrences, spirit-of-the-time topics
use, purpose	add to newspaper articles; serve mainly orientation	can add to printed or spoken texts; to decorate or create appetite
description	well established: stick to conventions or use graphic variables, establish an information hierarchy, add text for providing “addresses“	rapidly growing field: package the many information in handy, self-explaining and illustrative graphics; use mixed media
driving concept	to be factual, objective	to be attention-grabbing, catchy
aim	objective communication of geospatial relationships → overview	efficient communication of facts → easy memorizing
approach	first details, then layout → various aspects matter	first the whole, then details → a total work of art
focus	“carto“	graphics
about	information communication	infotainment
appearance	plain; formerly in black-and-white, nowadays in colour	graphically outstanding: use of colour, 3D-effects
spatial reference	always with spatial reference, i.e. maps or map sketches	often not bothering about the spatial reference (only via annotations), i.e. also other formats than maps
maps	maps, i.e. including a title, legend	as a map often not complete

	and scale	
map projection	consider properties of map projection	no consideration / awareness of map projection properties
generalization	cartographic generalization (maintaining landscape characteristics)	simplification acc. to graphics (led by topic)
base, background	complementary base map	graphically designed background
level of detail	can be detailed	often sketchy, coarse
symbols	map symbols / diagrams → associative, graphical variables (acc. to measurement level)	use of pictograms, icons, logos → graphical appearance / design
annotations, lettering	type positioning rules, type variables	typography as design element
judgement of result	acc. to spatial pattern	acc. to overall design
public perception	very old, following traditions, approved; outmoded	fashionable, questions of lifestyle or social distinction, individual addressing, narrative character, emotional link
cartographers' view	correct	persuasive
designers' view	guided by strict cartographic rules, no experimenting	playing with graphical possibilities

3. The Resulting Map Depictions

3.1. Selection of Topics and Task

Next, the students can choose among up-to-date topics to be visualized. Each student will receive different thematic data being related to administrative units (Germany, Europe, or the world). Nowadays portals on statistical data (e.g. destatis.de, Eurostat) facilitate this otherwise cumbersome task of finding and providing data on up-to-date topics like fishing by-catch, organ donation, death of bees, waste, single parents, nurseries, per capita debt, investment per university professor, ratio of graduates, wealth, Internet users, weapons, backache, or dog bites.

The students are now challenged to depict their one or two, sometimes three data fields on a DIN A4-format sheet each: as a traditional map suitable for a conservative-style newspaper printed in black and white and as a colour info graphics for e.g. a stylish magazine. Importantly, the info graphics has to make use of the spatial reference. Neat scribbles by hand are also allowed but only sometimes handed in, in particular when the base map of administrative units is already provided as digital file. Both depictions are to be presented and layouted in combination with a text

which the students are asked to inquire about, to phrase and which has to accompany the graphical depiction. The challenge really is to meet the earlier revealed differences between the two types of geospatial visualizations with a correct and graphically appealing solution each.

3.2. Selected Examples of Student Works

So far the seminar has taken place three times with 47 distinct topics having been visualized. A small subset has been selected here to show the bandwidth of attractive solutions, with a focus more on the info graphics. It should be mentioned that the students' work had been discussed and commented during the work on the assignment but with no amendments or corrections after their assessment and handing-back to the students.

Figure 1 shows a very neat result for data on per capita depth per German state. The topic has been thoroughly investigated. The distinction between the two versions is clearly visible and also mimicked by the texts. While the info graphics works with 'mountains of debt' (i.e. prism map method), the map uses proportional bars stretching downwards, as it is about lacking money. The example of *Figure 2* is even more striking regarding its distinct design. 'Deadly dog bites' is the serious topic which invites for additional graphics to be added to the map. The text accompanying the info graphics plays with a number of proverbs. *Figures 3* and *4* provide five further examples, but of info graphics only, to demonstrate their versatility and the creativeness of the students.

4. Benefits for the Students and for the Lecturer

4.1. Benefits for the Students

The assignment has proven to be of fun and benefit for both the students and the lecturer. First at all, the students are fascinated by the task and put a lot of efforts in their individual elaboration of the task. They are generally highly motivated, i.e. after having already a good knowledge on thematic cartography and the handling of DTP software, in this task they can readily start being creative. Up-to-date or unusual topics further enhance the motivation as does the individual instead of group working plus the first-time depiction within a student assignment.

4.2. Benefits for the Lecturer

For the lecturer it is fascinating to look through the versatile results instead of marking similar student assignment outcomes. But most importantly, this assignment allows the lecturer to get a very good picture on the

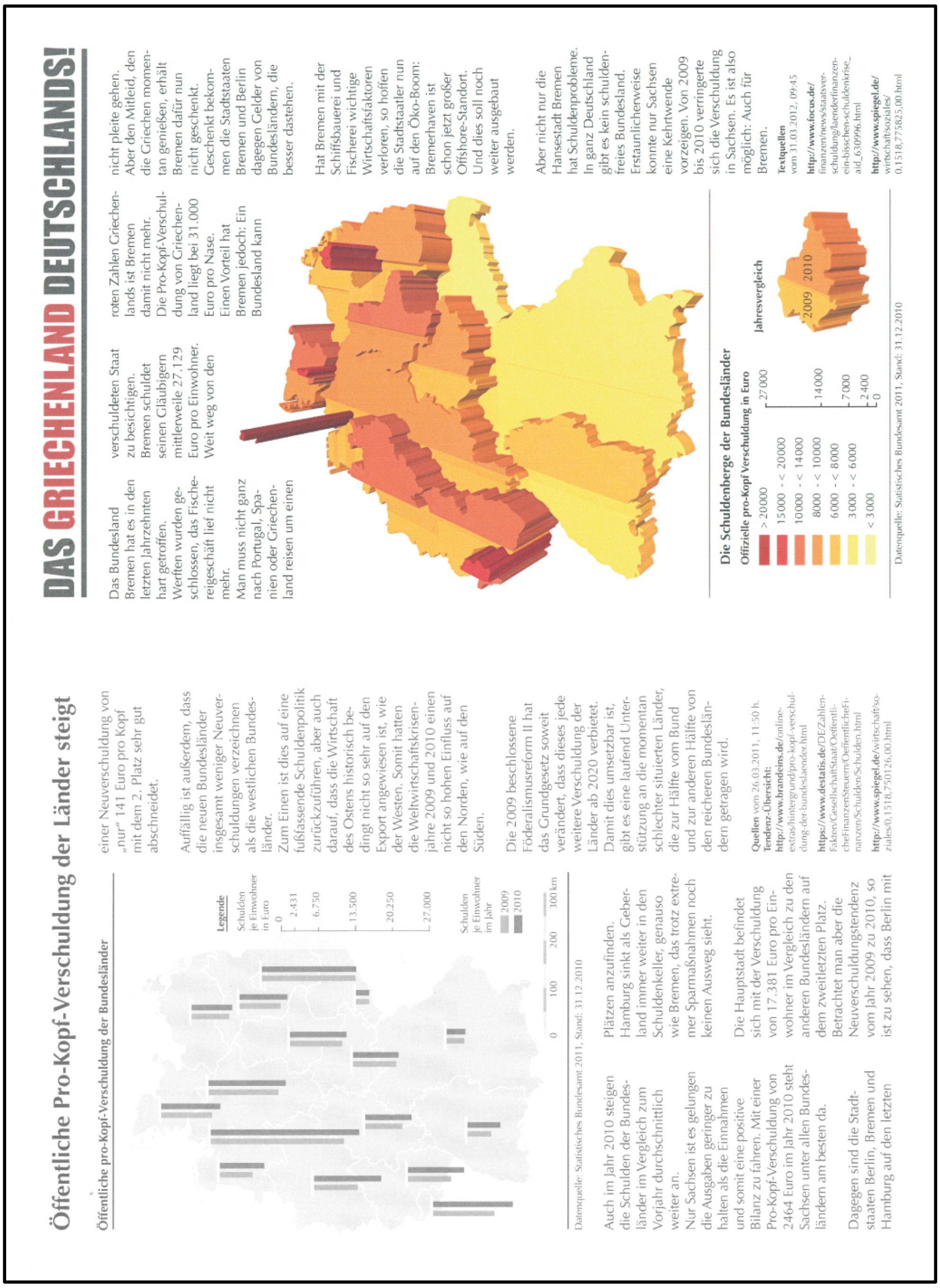

Figure 1. Per capita debt of the German states, 2009 and 2010. Visualizations as traditional-type newspaper map vs. info graphics, each embedded in complementary text (Irene Johannsen, SoSe 2012).

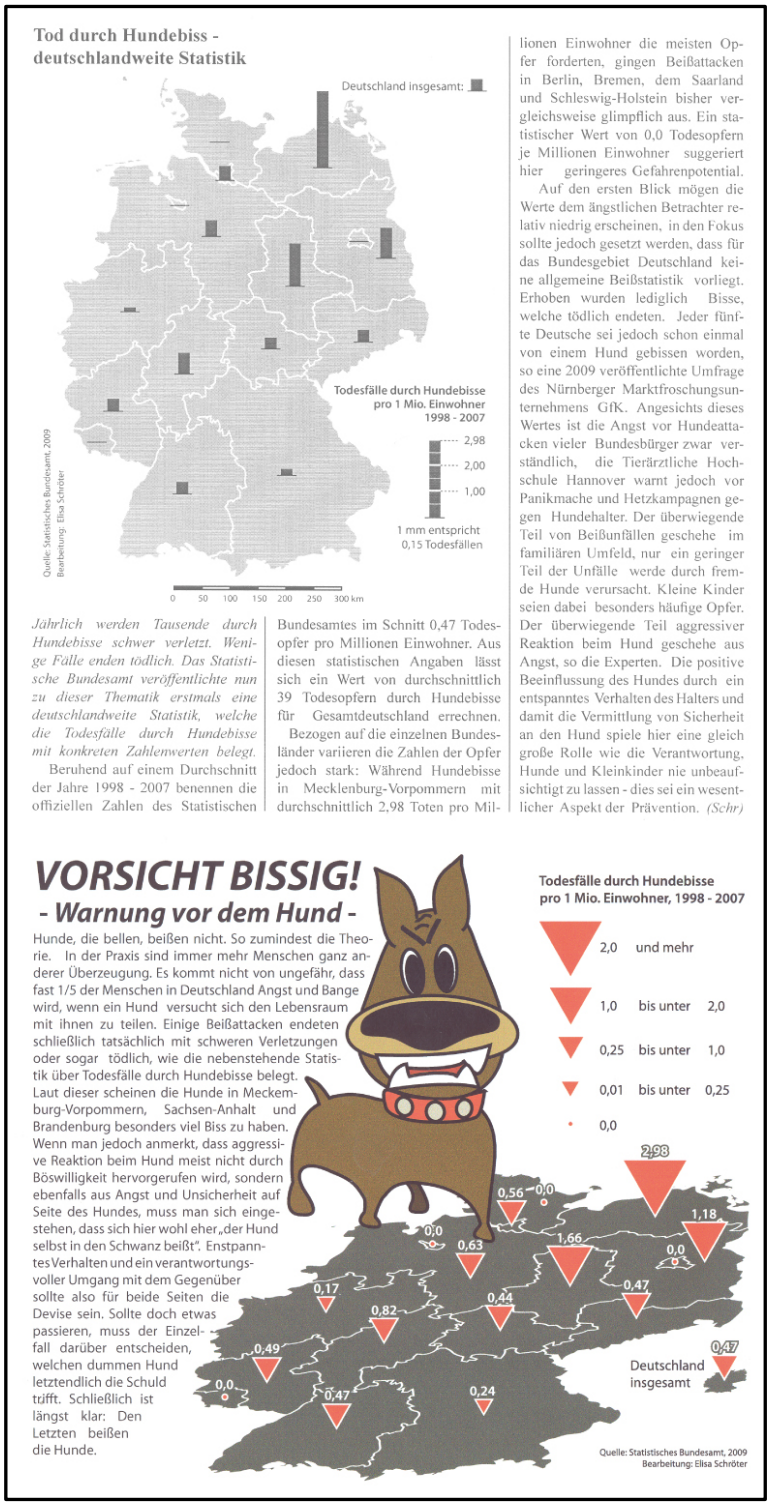

Figure 2. Deaths by dog bites in the German states, 1998 to 2007. Visualizations as traditional-type newspaper map vs. info graphics, each embedded in complementary text (Elisa Schröter, SoSe 2012)

Figure 3. Examples of info graphics related to waste (Nina Bayer) and single parents in the German states (Michael Oßwald, both SoSe 2011).

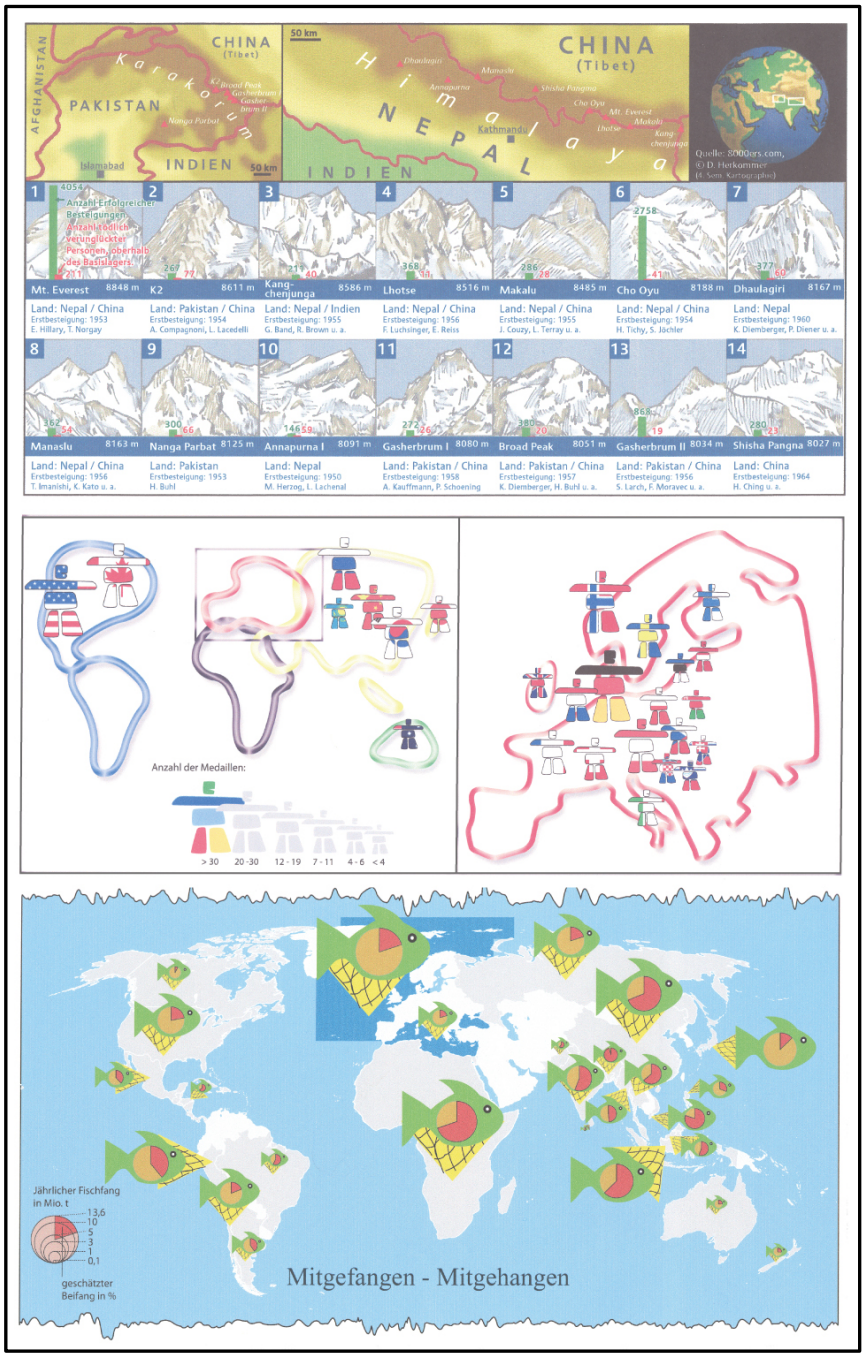

Figure 4. Further examples of info graphics related to eight-thousanders (Daniel Herkommer), metal count of the Winter Olympics in Vancouver 2010 (Anja Obereisenbuchner), and fishing by-catch (Philipp Seyerlein, all SoSe 2010). Accompanying texts are not included here.

individual qualities and skills of each student: talents are revealed related to a) map design (following the cartographic rules in regard to map layout, graphic variables, map types), b) graphic design (handling of vector graphics software, possessing of a so-called 'graphical eye', use of colours vs. black & white, typography), c) text phrasing (putting a text/story together, structuring the text, phrasing neutral map titles vs. catchy ones), and d) geographic interpretation (explaining patterns). In addition, it becomes clear which student is e) interested and informed, f) works thoroughly, and/or g) is creative.

4.3. Feedback and Wrapping it All up

When handing the assignment back, feedback is provided to the students while jointly looking at all assignments and critically assessing the various results. Obviously one can learn from good and not-as-good examples and thus the open discussion is for the benefits of all. The students get the chance of expressing their thoughts, ideas and questions. While the lecturer can use the opportunity for repetitions of cartography-related issues right-away due to having as many examples at hand. The revealing of major, still existing knowledge gaps might lead to the decision to consider an extra session on a particular topic during the weekly meetings to come.

5. Conclusion and Outlook

Therefore, this first assignment is a perfect introduction into the broad topic of this rather practical seminar as well as an addition to the later major assignment of planning, designing and compiling a map product from the very scratch, which in comparison covers almost the entire semester, is done in groups of two, and therefore often experiences motivation levels diminishing with time. It offers the opportunity to the lecturer of revealing each student's cartographic talents regarding a wide range of cartographic skills, which should not be neglected in our otherwise rather IT-focused training of the coming cartographer generations.

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